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A Study of Experimental Frustration

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A STUDY OF EXPERIMENTAL FRUSTRATION

I. Introduction

Experimental procedures used in previous studies of frustration

Experimentally produced frustration has been studied frequently by the *unsolvable problem* technique.

Marston (47) used a portable typewriter case, with a fastener that was difficult to open, in thwarting a child's attempts to retrieve some toy ducks placed therein. Five reaction types he noted are listed here in the order of frequency: abandoned task but returned when coaxed; complained; gave up and appealed for help, returned to task on urging; gave up, refused to return; readily worked on box, making no complaints and needing no urging. Marston concluded that the introvert silently and submissively keeps trying whereas the extrovert gives up and refuses to go on when certain that the task cannot be done.

Rosenzweig (60) gave college students paper-and-pencil geometric puzzles and anagrams, the majority of which were unsolvable. He found that there were individual differences shown in reaction to the frustration experience, and that the subject reacted with greatest aggression ("extrapunitiveness") where he had the greatest confidence and ability. He also states that the offering of incorrect solutions as correct was more characteristic of individuals who had a high degree of aggression and a strong need for dominance, and who were extroverted.

Verbal puzzles were given college students by Philp (58), who instructed them to introspect concerning their feelings while attempting to attain a solution. It was found that frustration was accompanied in these subjects by a confused experience of conative effort and increased emotional experience.

Brown (6) asked patients in a mental hospital to recover an object at a distance without stepping across a line on the floor. Although there were only two solutions, the subjects were told that there were three methods. Behavior used in attempts to reach a third solution were rated on ten criteria in regard to normality of behavior. Schizophrenics were found to be most abnormal while patients with compulsive neuroses had a higher normal rating than the control group of normal subjects.

An unsolvable problem has been created in some investigations of experimental frustration by making *excess demands* upon the subjects.

In a study by Adams (1), demands that were physiologically impossible were made upon subjects in a steadiness test and in tapping speed. This work led him to the conclusion that Neurotic Tendency (as measured by the B1-N score of the Bernreuter Personality Rating Scale) can be differentiated in terms of overt social behavior and in terms of manual task performance. He further found that the individuals who differ widely in their susceptibility to frustration cannot be differentiated in terms of agitated behavior or characteristics of manual task performance.

Freeman (20) prohibited adult males from micturition. He concluded that individuals who cannot long withstand experimental loading recover less quickly from its effects than do those with greater abilities in this direction. He adds that the stable subjects appeared more resilient in this experience, reacting adequately, but not excessively to this frustration.

A box that demanded very careful work in order to hold all the toys that the subjects were asked to place in it, and a box, too heavy for the child to lift, placed over some toys, are two excess demands made of pre-school children by Keister and Updegraff (33). Immature responses (i.e. destructive retreating, rationalization, emotion) were shown by 18 per cent of these children. In a continuation of this study, they conclude that it is possible to retrain these children so that they will not act immaturely when returned to the same frustrating situation.

An unreasonable time limit and suggestions of intellectual inferiority were given to college students while they worked on a maze, nonsense syllables, steadiness test, and arithmetic problems. This work, by McKinney (48), led to the conclusion that the time limit increased errors, while the suggestion of inferiority made the error total greater. The results indicate that emotion cannot act as a motivating factor in an intellectual task or skill. Restlessness, rationalizations, and aggressiveness increased during the experimental situation and markedly so when inferior feelings were developed.

Sears (64) asked college students to sort cards and caused them to "fail" by telling them incorrectly that they were doing poorly. This artificial failure led to impairment of ability in other tasks that immediately followed, and to impairment of ability in card sorting itself. Sears believes that this is proof for the repression sequence, in that the anticipation of failure built up in the card sorting represses the desire to succeed. In a later study Sears collaborated with Hovland and Miller (66) in an experiment that used sleeplessness plus various kinds of obstructions in the plans to create the interference for college student subjects. This study concluded that sleeplessness is sufficient frustration for aggression and that the aggression may be accurately measured by a time sampling procedure.

Physical obstructions have been used in order to experimentally produce frustration.

Barker, Dembo, and Lewin (5) gave pre-school children some attractive toys with which to play and later returned the subjects to their previous collection of less inviting toys while the better ones were left in sight behind a barrier of wire netting. They found that regression occurred in the constructiveness of the play showed by the children in using the older toys. In general, the amount of regression was positively related to the strength of frustration. Changes in mood and emotional expression were marked. It was concluded that "regression, at least in some of its forms, is de-differentiation, the reverse of maturation."

Sears and Sears (67) withdrew the nipple from the mouth of an infant, withholding it until crying occurred or sixty seconds had passed. By withdrawing the nipple after different amounts of milk had been consumed, the strength of the hunger drive was varied. It was found that an increasing latency for the crying response occurred when there was an increase in the amount of milk taken. If the frustration occurred while the hunger drive was still strong, crying occurred at once; if the infant was thwarted when the hunger drive was nearly satisfied, movements toward the bottle would replace crying.

Maier and Glaser (45) "showed that exposure to various forms of auditory stimuli (jingling of keys, sound of rushing air, electric bell, and buzzer) produced attacks in a large percentage of animals but the addition of barriers

which restricted the movements of the animals and the addition of a conflict based upon jumping to the negative card (a trap-door they had learned to avoid) greatly increased the occurrence of attacks in a group of rats." Maier and Glaser, therefore concluded that even exposure to direct stimulation could be regarded as a conflict situation, since the auditory stimulus in that case gave no direct response but was excitatory in nature, and the enclosed space restricted general behavior and served as the inhibitory aspect of the situation.

Apes were taught to pull on a continuous belt until a food container, fastened to the belt, came into the cage. They were frustrated by braking the belt so that it would not move, by causing the food container to be empty, or both. This study by Haslerud (26) led to the conclusion that the interruption of the pull resulted in twice as much observable frustration as the pulling in of an empty food container. Adults excelled children in their resistance to frustration, but differed widely among themselves. These animals tended to adapt to the frustrating situation. Haslerud concluded that frustration is much more a function of how a reward expectancy is thwarted than a simple loss of the reward, and that regression is the most frequent form of reaction.

Anderson and Liddell (2) point out the importance of the restraint placed upon the animals' movements while using the conditioned response technique (described below) in creating neurotic behavior in animals. They believe that restriction of the animal's movements is important in preventing release of tension through motor activity. Cook (8) supports this interpretation in his work with white rats.

Conflicts have been used to study experimentally-produced frustration.

Maier (42) produced a conflict between excitation and inhibition which caused rats to exhibit a convulsive attack described as the "neurotic pattern". The excitation in this study was a blast of air sounded at the rear of a small platform on which the rat was placed. The inhibition was a card in front of the food entrance they had previously been trained to avoid. This situation created a conflict between the necessity of responding and the inability to make a learned response.

College students were put into a state of conflict by Sears (65). They were taught to draw a line away from a lighted red bulb, and toward a lighted green bulb. The bulbs were lighted in random order and finally both lighted at once. This conflict was resolved mainly on the verbal level with questioning or exclaiming remarks. Manual reactions exhibited blocking and indecision.

Lewin, Lippitt, and White (35) exposed groups of boys to democratic, aggressive-autocratic, laissez-faire, and apathetic-autocratic social climates. Each group was a club of five boys working on theatrical masks. Every group experienced all of the climates under each leader. The greatest conflicts in this study occurred on the days when the clubs were changed from one type of group control to another. In passing from apathetic-autocracy, for example, to democracy, there is a great increase in aggressions within the group which settles to normal. In passing from democracy to apathetic-autocracy there is a swing past the normal for aggression, which does not return soon to normal. No matter who he is, 19 out of 20 children liked their democratic leader best. Autocratic groups were 40 to 1 more aggressive than the democratic groups.

A conflict which cannot be resolved can be developed by gradually reducing the difference between a negative and a positive conditioned stimulus. Krasnogorski (34) developed irritable, aggressive, and restless behavior in a previously well-behaved child by lessening the difference between the number of beats of a metronome for the positive stimulus (a rate at which he would receive food) and the negative stimulus (a rate during which he would receive no food). He concluded that the more difficult the differentiation became, the more the balance between irritation and inhibition was disturbed. In this case irritation predominated, until inhibition finally developed and the child fell sound asleep in the laboratory.

Pavlov (55) produced neurotic behavior in dogs with the same method. Anderson and Liddell (2) produced it in sheep; and Curtis (9) in pigs. As has been mentioned above, Anderson, Liddell, et al., emphasize the piling up of strains, whether they be physical or social, until the nervous system of the animal breaks under the load. Pavlov and Krasnogorski, on the other hand, believe that neurotic behavior occurs when there is an imbalance between the inhibitory and excitatory state.

"Neurotic behavior" in animals has been observed and reported by the following in addition to those mentioned above: Gantt (22); Karn (32); Jacobson, Wolfe, Jackson (30); Lush (40); Dice (12); Morgan and Morgan (49); Humphrey and Marcuse (28).

THE CONSEQUENCES OF FRUSTRATION

The types of behavior that are considered by these experimenters to be typical reactions to frustration are listed below. After each behavior there is a group of names with dates referring to studies in the bibliography. In each case the author cited believes that the type of behavior preceding his name is a frequent, or only, form of reaction to frustration.

1. *Aggression:* Sears, Hovland, Miller (66); Sears and Sears (67); Lewin, Lippitt, White (35); Dollard, Doob, Miller, Mowrer, Sears (13).
2. *Regression:* Hamilton, Krechevsky (25); Sanders (63); Mowrer (50); Keister, Updegraff (33); Barker, Dembo, Lewin (5); Haslerud (26).
3. *Fixation:* Everall (14); Hall (23); Hamilton (25); Patrick (54); Maier, Glaser, Klee (44).
4. *Repression:* Sears (64).
5. *Confused conative effort:* Philp (58); Sears (66).
6. *Piling up of nervous strain:* Anderson, Liddell (2); Liddell (38); Curtis (9); Cook (8).
7. *Conflict between excitatory and inhibitory stimuli:* Pavlov (55); Krasnogorski (34); Maier (42).
8. *Increased motor activity:* Luria (39); McKinney (48); Adams (1).
9. *Reaction to frustration may include any or all of above or others:* Marston (47); Rosenzweig (61); Brown (6); Hinton (27).

MANNERISMS AND FRUSTRATION

The mannerisms used by an individual change during frustration.

Earlier mention was made of the study by Adams (1) in which he found no difference in the agitated behavior of subjects who were obviously different in their susceptibility to frustration. However, this agitated behavior did differentiate the two extremes on the Neurotic Tendency scale of the *Bernreuter Personality Inventory.*

In McKinney's work, described above, the subjects were off guard concerning their incidental behavior because of the job at hand. McKinney believes that emotion may be measured in this experiment by the number of errors and also by the number of movements and verbalizations

which occur during the task, since emotions and mannerisms increase in direct proportion.

While 44 subjects were working on arithmetic problems, their muscular activity was studied by the action potential method in an experiment by Davis (10). He concludes that no evidence of muscular disturbance during frustration was found. The results did show that there is a continuous relation between muscle activity and difficulty of the task with no sharp break that might be taken as indicative of the occurrence of frustration. With increasing idfficulty of the task there was a corresponding increase in the accompanying action potentials.

Luria (39) found that hysterical and neurasthenic patients were sharply differentiated from normal subjects while waiting for an examination. Their reactions were diffuse, and excitations found immediate motor outlets; they were "unable to keep the conflict isolated from the motor area". Luria states that among these neurotics there was not a single case of complete control and regulation of movements. Luria's work leads him to postulate two types of individuals: "reactive-stable" and "reactive-labile". About 24 per cent of his subjects fell into the former group and were typified by "complete coordination and relative regularity of work". The reactive-labile group contained about 31 per cent of his subjects, and were typified by motor responses of considerable irregularity; every excitation passing at once into motor areas. Luria develops strong support for the hypothesis that the degree of disorganization (i.e. type of behavior shown by the "reactively labile") is a function of the difficulty of the task for the subject. As difficulty increased, disorganization increased. Luria was able to show that differences in the degree of organization among subjects of the same capacity could be traced to problems in the subjects' lives.

Neurotic mannerisms were found to be more frequently displayed by children who were in a traditional teaching situation than they were by the same children in a free play situation (footnote, p. 35, Olson (53)). An analysis of 100 mannerisms of seated kindergarten children revealed that 48 per cent were neurotic, while only 21 per cent were neurotic when the children were at free play.

FRUSTRATION AND THE LEVEL OF ASPIRATION

The threshold of frustration may vary from subject to subject, and from situation to situation for a given individual. An important factor in such variations is the level of aspiration.

Lewin and Hoppe (36) define level of aspiration as "a person's expectations, goals, or claims on his own future achievement". Later, they add: "The experience of a performance as a success or failure does not depend alone on objective goodness, but on whether the level of aspiration appears to be reached or not to be reached." Sears (64), and Frank (15, 16, 17) support Lewin and Hoppe's point that success and failure cannot be defined in terms of the score achieved. One whose objective performance is outstanding is disappointed because he had hoped to do better; another with a median score is pleased with himself. It is implicit also in their writings that very hard tasks which are beyond the child's aspiration level cause no experience of success or failure, and the same is true of very easy tasks. The conclusion that may be drawn from these workers is that the frustrating task must be within the range of the subject's abilities if he is to be sensitive about his fortune on the task.

POINTS OF AGREEMENT IN FRUSTRATION STUDIES

There are some common points on which all of the above studies agree, either as directly described in the previous review or implied in the conclusions stated. These will be briefly described:

1. An interference or blocking of an on-going process is always present in frustration. This may be an unsolvable problem, a demand beyond the physical abilities of the subject, a physical obstruction, a choice-conflict, or a conflict created by narrowing the difference between positive and negative conditioned stimuli.

2. The organisms exhibit a change in behavior as a result of the interference, and the behavior appearing is usually unadaptive.

3. Individual differences appear in the intensity, type, and rapidity of these changes in behavior.

4. Some subjects, but not necessarily all, react to the frustrating situation with strong emotional behavior.

5. Experiments in which groups of subjects are frustrated together always develop *some* aggressions within the group.

6. Ability to "tolerate" frustration is an indicator of a healthy personality.

7. There is apparent agreement that all work with human beings should allow an opportunity for tension release through refusal or "no-response".

POINTS OF DISAGREEMENT IN FRUSTRATION STUDIES

There are some pertinent points on which the above studies disagree:

1. There is disagreement as to whether frustration should be defined in terms of a certain state of affairs, in terms of the reaction of the individual to that state of affairs, or in terms of both.

2. There is disagreement as to whether the reaction shown by a group of subjects in a given frustration is typical of reactions to every frustration or whether it is characteristic only of the type of frustration being used in the study.

3. There is disagreement as to the typical consequences of frustration.

4. There is disagreement in studies using the discrimination technique as to the role of nervous strain and/or the conflict between excitation and inhibition in producing abnormal behavior.

THE PROBLEM

It is clear that the following factors are of importance in studying experimentally induced frustration:

1. That the subject sees himself as an instrument of his own success.

2. That the unsolvable problem is a form of frustration for the subject only if he believes he can succeed in the task.

3. That the patterns of behavior shown in reaction to frustration need clarification.

4. That the mannerisms used during frustration may be used as indicators of energy output.

5. That knowledge of behavior of subjects in a control situation is needed when studying frustrated behavior.

This study takes cognizance of the above factors; its aim is to make an objective investigation of the reaction of human beings to a frustrating situation. The objectives may be specifically stated:

1. To create a frustrating situation similar in all respects but one to a previous control situation.

2. To study the change in the behavior of children that is caused by their shift from the control to the frustrating situation; and which supports the notion that this is a frustrating situation.

3. To determine if there are characteristic behavior patterns displayed during the frustrating situation.

II. Method

Procedure and Apparatus Employed

The method used to produce the frustrating experience was based on an *unsolvable learning task.* This required that the subject learn a series of numbers that have increasing lengths and difficulty until he, unexpectedly, becomes unable to learn series that are shorter than those already learned.

The numbers in the series were presented to the subject, one at a time, every three seconds, by lighting one of five numbers pasted to the glass front of a box. Confusion in the situation was created by asking the child to call arbitrarily any number from one to five after which the first number in a series was lighted. Another number would be guessed aloud, and the experimenter would light the second number in the prepared series, and so on until the series in hand had been completed. The subject would then return through the set in the same manner, one number at a time, attempting to correct his wrong guesses of the previous trial. The series was considered learned when the subject called each consecutive number correctly.

As the number series increased in length, they were made more complex and more difficult. When a series of fourteen or fifteen digits was given with many duplications of the same numbers, it was possible to change the numbers in the middle portion on each repetition of the series without the subject realizing that they had been changed. At that time a number series became unlearnable even though it appeared no different from any of the others. It was simpler than some of the others, they were told, because it was shorter than the series that they had already successfully learned. This "juggling of the numbers" provided the frustration used in this study.

Very simple series were given at first, and longer ones later as the ability of the child improved with practice. The length of the series could, therefore, be regulated to the talent of the subject so that he would succeed in the beginning, to form a contrast for that later frustration period. Moreover, this process made it possible to create success for the subject by simply lighting the numbers that were called, whatever they were.

In order to bring pressure into the situation, two telegraph keys were put in circuit with an instrument that momentarily closed the circuit every three seconds. An electric counter was in circuit with the telegraph keys so that the number of three-second periods were automatically counted for the experimenters. Upon each click of the keys the operator would light the next number in the series. This meant the subject had three seconds to make up his mind and call his number before the next number would flash—a recurring irritant disturbing in itself. Further, he must restrain his impulse to call the next number for three seconds until the light flashed again. This time limit caused much more "nervous" behavior than appeared without it.

A flash box was placed at one end of a small (12′ x 10′) room. The subject sat at the other end of the room. One experimenter, the *operator,* sat behind an opaque screen on one side of the flash box. Another experimenter, the *observer,* sat at a small table on the other side of the flash box in sight of the child. He could see and signal the operator behind the screen.

The operator pushed the button for the flash box and recorded the errors, omissions, and time. The observer de-

scribed the behavior of the child as fully as possible, in pencilled notes.[1] Time samples of gestural behavior, described below, were also made.

The subjects were fifth and sixth graders in the University of Michigan Elementary School. The data of 34 (17 boys and 17 girls) are summarized here. The experimenters were familiar to the subjects, the observer having participated in a pageant with some of the subjects; however, both experimenters spent one morning in the schoolroom with the children in order that they might be recently well known. The subjects were brought to the laboratory with the understanding that they were to take a test. Tests are common experiences for them. They were called for by the observer, who introduced them to the operator. The latter explained all the working parts of the machinery, allowed the child to play with the telegraph keys, push the light buttons, etc. The directions given to each child were not exactly comparable, except that the subjects understood that the problem is "to see how quickly you can learn this series of numbers". Sample series were given, and questions answered until it was certain that the child understood what was expected of him. The subject was told that the ob-

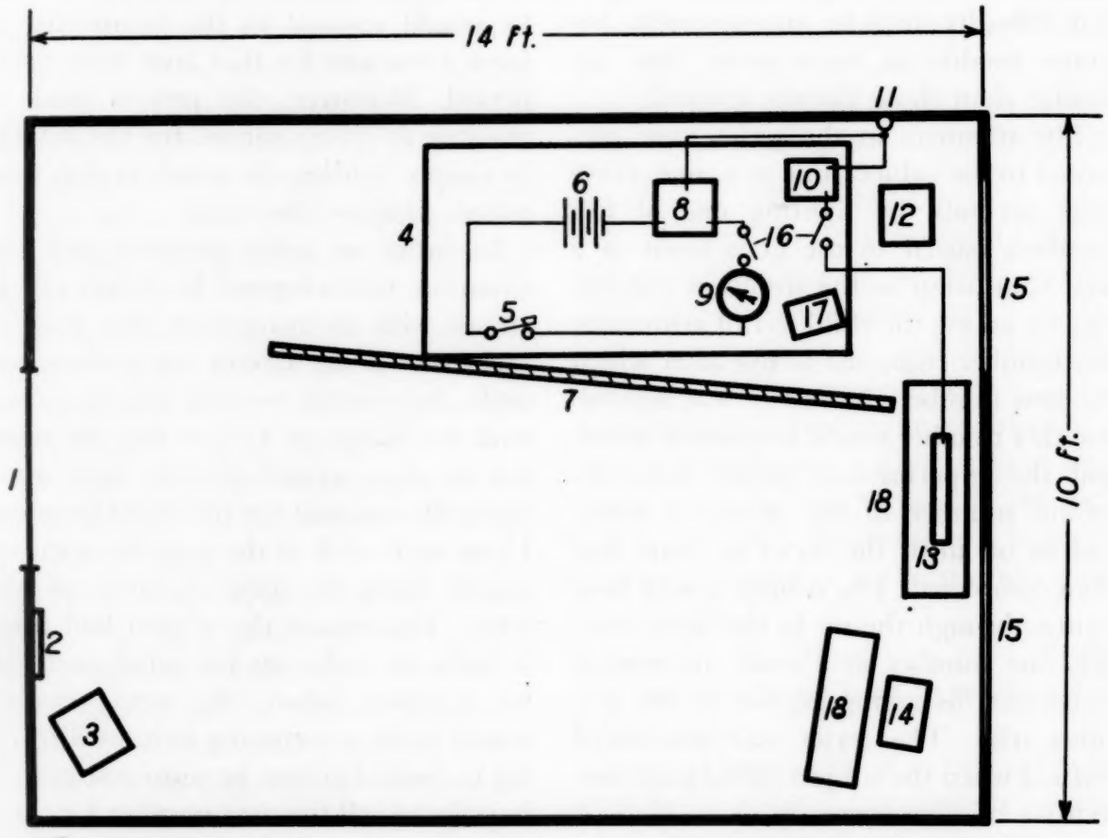

FIG. 1. *Diagram of Laboratory Arrangement.* 1—door, 2—wall mirror, 3—subject, 4—large table, 5—telegraph keys, 6—batteries, 7—opaque screen, 8—electric impulse "maker," 9—electric impulse counter, 10—flash box key board, 11—electricity wall plug, 12—operator, 13—flash box, 14—observer, 15—window (shades pulled), 16—electric switches, 17—operator's score pad, 18—small low table.

[1] A dictaphone, moving pictures, pre-formed check lists, and rating scales were tried in recording this behavior. All were more elaborate than necessary for accuracy.

server's task was to keep the score.

Each subject was brought to the laboratory for *four* consecutive days. Each visit consisted of fifteen minutes' actual working time. The first day was spent learning series ranging from very simple to medium difficult. On the second and third days the series were made longer and more complex with each success of the child. On the fourth day the series were made non-learnable as explained above. This was the frustrating experience.

At the beginning of each new day the subject would overlap the last series of the day before in order that the day might begin with a rapid success. He would continue working until the end of the time limit, doing as many series as possible that time.

Three one-minute time sample observations were made by the observer on each of the days. During these observations, quantitative notation was made of all the gestures, remarks, and any other bodily signs that occurred during the sixty seconds. These samples were made during the second minute, the eighth, and the fourteenth. A code was prepared so that all such behavior could be rapidly recorded. One-minute time samples are believed long enough for validity as samples of the subject's gestural behavior, since the observer was ten feet from the child and could readily see every apparent movement made by him, and since they actually accounted for 20 per cent of the total time spent in the laboratory. General comments qualitatively describing the behavior of the subjects were also noted during the twelve minutes when time-samples were not being made.

A small mirror hung on the wall three feet over the head of the subject. The observer pointed to the mirror saying: "I can see the numbers reflected there, that is how I keep score. I sit here (ten feet in front and to the right of the child) so that Bill (the operator) and I can see each other and work together." The mirror made it possible for the observer to appear to be concentrating on the number reflections while noting all reactions of the child. This device helped remove the observer from the social field of the child.

Teachers of these students watched for behavior in the classroom that was pertinent to this study and gave this information to the writer. Notes were made by the experimenters of any contacts with these subjects outside the laboratory and for a period of one year following the study.

Measurements on various types of tests, daily journal records, health records, and measures of achievement for this group were available in the files of the school, and served as a source of information concerning the behavior of these subjects in normal life and other problem-solving situations. These measures were not examined until all the laboratory data for this experiment were obtained.

An arbitrary decision was made that any subjects who accused the experimenters of changing numbers more than three times would be allowed to succeed quickly, dismissed, and not used as part of the data. All accusations were denied and every reason for thinking that the numbers were being changed was discussed with the subjects and explained. As far as could be known, no subject included in the data left the laboratory believing that he had been cheated.

In short, an attempt was made to make the first three days as successful as possible in contrast to the fourth which became unsuccessful, and thus frustrating.

POINTS IN WHICH THIS STUDY DIFFERS FROM PREVIOUS ONES

The procedure reported in this study is different from previous research in frustration in the following ways:

1. The subjects were frustrated by a problem that appeared to them to be within their ability instead of one that the subjects doubted they could solve. Training on earlier days tended to create confidence.

2. Usage of three control days, prior to the fourth day on which frustration occurred, allowed for a comparison of behavior during frustration and behavior during a control situation that is similar to the frustrating one but successful.

3. Success was created for the subject when he was not able to create it for himself, except for the last day. Thus, the task could be made possible of accomplishment for any intelligence, ambition, or speed.

4. A learning task was used instead of an insight-demanding problem.

5. The subjects were allowed to relax in a comfortable chair and required to hold nothing in their hands. All motor movements could be clearly seen instead of being hidden by paper and pencil activities or manual manipulations.

6. Pressure was brought into the situation by placing a three-second time limit on the selection of numbers. This was long enough to allow realization of failure, but short enough to be uncomfortable.

7. Behavior outside the laboratory was noted by teachers and assistants. The behavior of the subjects toward the experimenters was noted for one year following the laboratory study.

8. Gestures were counted by time sampling to give an objective indication of energy release.

9. Neurotic mannerisms shown by subjects were studied in analyzing their behavior.

III. Results

1. The Behavior on the Frustrating Day as Compared to the Other Three Days for the Group as a Whole

The Behavior Classification Scheme

In order to make the laboratory behavior descriptions of each subject comparable, a classification scheme was devised. The scheme is based on four major headings with sub-headings under each.

The frustrating experience used in this study is a mild one so that many types of reaction to frustration, especially those of an extreme nature, will not appear in the following behavior classification scheme. Further, the observation method used limited the discernment of adjustment-types to those identifiable in overt behavior. Therefore, phantasy, projection, and other subjective responses to frustration are not recorded here. Another possible limitation to the following classification scheme is that this study used a block, or interference, to produce a frustration. One wonders if a choice conflict situation would have produced a different kind of reaction than did this frustration experience.

Classification Scheme and Rating Scale of the Subject's Behavior in the Laboratory Situation

Defense—Behavior Which Tends to Guard the Individual's Personality from the Situation Which Induced It.

1. Aggression: An act whose goal response is injury to an organism (or organism surrogate).
   a.[2] Aggression against experiment in general and toward flash box.
      1. Mild mannerisms of distaste. Unfriendly tone in asking or answering questions. Signs of mild dislike. Repressed words, expression of disapproval.
      2. Overt expression to statements of disliking task plus distinct physical signs of distaste. Sarcastic tone.
      3. Vigorous, purposeful, verbal and physical displeasure expressed for the situation.
   b. Aggression against experimenter. (As under a. above with direction obviously toward experimenter.)
   c. Aggression against subject self. (As under a. above with direction obviously against subject self.)
2. Rationalization: The process of divising reasons for behavior that is unacceptable to himself.
   a. Shakes head in a friendly fashion as though saying to self: "Why, of course, I *knew* that; surprised at error." Mannerisms of being just a little off form, will soon improve.
   b. Frequent verbal statements of: "I mean!" and quick attempt to correct self. Brief start to explanation—usually abandoned half-way. States "I have forgotten this!"
   c. Very frequent offering of excuses in a vigorous and detailed manner, sometimes ignoring numbers in order to explain a given error, subject's health, desire to succeed, etc.
3. Egocentrism: The process of making obvious attempts to attract attention.
   a. Fleeting silly faces. Reserved clowning. Few short exclamations.
   b. Exclamations in good volume, frequent, and often grown into comments of no significance to the situation. Gestures wildly, much silly behavior. Hums or other noises between number series.
   c. Uses many devices and as often as he can to attract attention to himself; whistles, hums, sings, exclaims, asks pointless questions, silly faces, etc.

[2] a = 1, b = 2, c = 3; used in rating the intensity with which a child used one of these forms of behavior. Data on intensity ratings are omitted from the present report.

Withdrawing—Behavior Which Retracts the Organism from the Situation Which Induced It.

1. Inattention: The act of allowing the interest to wander from the task without placing the attention elsewhere; free floating attention.
   a. Yawning, stretching, apparent disinterest in task showing through.
   b. Bored tone. Sing-song voice. Not at all alert. Eyes wander almost constantly.
   c. Complete or nearly complete quitting in task. Pays very little attention to numbers, day dreaming. Calls no numbers, skipping whole series.
2. Regression: The act of returning to mechanisms more appropriate to a lower age level. (Restricted in this instance to behavior commonly called hurt, and crying.)
   a. Pout. Hurt expression. Sad tone. Huddles in chair.
   b. Voice trembling, near breaking. Face openly dismal. Difficulty in swallowing apparent.
   c. Tears in eyes. Openly cries.
3. Quieter, softer. A drop in the usual volume of voice.
   a. Perceptibly quieter in volume.
   b. Trailing of voice each time that an error is made. Later recurrence to strength.
   c. Voice sinks to a whisper. Often inaudible. Less vocal effort of all kinds.

Non-Adjustive Activity—Behavior that Provides No Release from the Influence of the Situation Which Induced It.

1. Anxiety: The act of showing bodily manifestations of uncertainty.
   a. Fleeting frowns and quizzical expressions. The wringing or rubbing of various parts of the body gently. Few sighs.
   b. Blushing and embarrassed smiles, few and not severe, do not spoil equilibrium of subject. Sighing often, gently.
   c. Sighs. Frowns. Blushes. Most activities upset and uncoordinated. Intense effort.
2. Tension: The act of tightening body muscles.
   a. Sits still, few bodily movements, shows signs of strain in face and position of limbs.
   b. Subject is definitely tense but lightly so, sometimes relaxes obviously and then tightens again.
   c. Sitting erect or leaning forward, continually alert with limbs tense. Movements tense. Fists clenched.

Cooperation—Behavior that Protects Personality by Placement of Energy in Attempts to Solve Problem.

1. Good natured, friendly:
   a. Smiles at experimenter at times other than while at work on task. Offers friendly comments when not at work.
   b. Cheery. Greets us cordially at all times.
   c. Confesses to liking for this problem. Very much interested in having experimenters for friends. Asks to be taken to laboratory whenever experimenter seen.
2. Attention High: Attention to task. (May be same as compensation.)
   a. Finds task a challenge. Interest stays high. Effort is apparent.
   b. Works like a machine. Alert. Attentively relaxed like a good shortstop. Snappy. Keeps trying.
   c. Tries very hard. Gives every indication of being interested, willing, and eager,—not tense.
3. Poised: The act of being emotionally at ease.
   a. Few signs of overt or covert reaction to the situation on other than a simple, intellectual level.
   b. Takes situation very much in stride.
   c. Relaxed and as comfortable as though reading the funny papers; not slouched. Shows no signs of strong reaction.

Some Sample Protocols as Illustrations of the Change in Fourth-day Behavior

Two sample protocols of the general notes describing the reactions of subjects on the various days will graphically depict the change in behavior on the fourth

day. These notes are slightly edited for coherence. Time-sample gesture accounts are omitted here as parenthetically indicated in the following.

1. J.G.: a girl became very much upset on last day after being unstable on first three days.

First Day

This girl had wanted to come to laboratory every day since she first knew that we were taking subjects; taken today because she begged so hard. Learned easily. When she did not understand she said so freely. Somewhat impatient and sarcastic in learning.

(First Sample Made)

Asked, "Why the screen?" coyly. (Rides operator.) I explain that this prevents her from being bothered by Bill's movements. She swings arms and shakes head vigorously on an error. Quite friendly and coy, although quietly so. Sits bent forward and gives numbers in a full voice. Seems interested but is surprised that this is all she is asked to do. Face of pain and great self-disgust on error. Mouth pursed and lips drawn with a martyred expression.

(Second Sample Made)

Sits quietly relaxed in chair. Fights errors and blushes when they are made. Has a tendency to begin omitting when she makes an error. "I don't see any point in it at all!" she says, looking up at ceiling in a grande-dame manner. Now calling numbers quite loudly, tone more disgusted. Bored facial expression and many frowns. She develops a very positive and confident tone when she is succeeding and knows it.

(Third Sample Made)

Omits on beginning of the run until the series have flashed by once. "What happened then; what was it?" in a very disdainful and superior tone when the operator made a mistake. When told "That's all," she replied, "That's good!" and slammed the door vigorously on leaving, with a pout.

Second Day

"Of all people, why ask me?" "I do not like it at all," said she upon being asked to come with me. "Why?" "Because you have to guess so many times and usually guess wrong. What is my score so far? Zero?" She was told that she is doing quite well. She asked other questions in a sneering, disparaging manner. "What's that for? How silly!"

(First Sample Made)

"Yesterday I missed half my play period! What makes that tick? Why doesn't he write and you push the buttons?" Sighs quite often with a heavy bored expression. Chews on fingers while sitting silently; stops whenever she misses badly. Relaxed in a comfortable posture; no tension. "I don't see what this teaches you!"

(Second Sample Made)

"What good is that battery?" (Being used as a shield for the writer's work.) "Can't you hold the sheet still yourself?" Missing and sighs deeply. Omits very often now and spits out first number in disdain when she feels inclined to begin again. "How many of these a day?"

(Third Sample Made)

"Shoulda took longer on that one," she said when she was told there is just time for one more series. Pouty, unpleasant, bored. No answer to our "thanks" nor to our request to ask another child. Just a pout and a vigorous slam of the door.

Third Day

Frowned and groaned about coming. Asked how many more days and replied "That's good," when told that there is only one more. Volunteered that she doesn't like it, "doesn't see what it teaches you."

(First Sample Made)

Hunched in chair and tries omitting on third minute. Does not do it at first. Calls number in a disgusted tone as though tired of it all. "How many more I gotta do?" Now biting finger nails and yawns. "This one is just opposite of the other one." Sighs deeply and smiles at box sardonically, while omitting frequently.

(Second Sample Made)

Is very obviously bored and displeased with the whole task. Shakes hands loosely at end of wrists, pants during words, blushes, fidgets on chair. Sighs, cries "Which one is it?" very sarcastically. Pouts openly and sullenly. Cocks head in a martyred expression. Sighs deeply and pants out words. Sighs and looks wide-eyed above her at the next "ready".

(Third Sample Made)

"Is this the last time I gotta come? I don't want to come any more!" she says, in a very aggressive tone. She became very angry during the sample. Stamped feet, glowered, shouted, sighed, snorted, showed dissatisfactions that were very aggressive and verbal too rapidly to write down.

Fourth Day

When I called her from the door of the room, she groaned and disappeared. When I entered the room, she had her back turned to the door in the corner of the room cutting paper. "I don't want to come." The writer made no reply. "I don't like it." Meanwhile she threw down her work and stamped into the hall. The writer asked her why she did not like it. "'Cause it makes me mad." "Why?" "'Cause I have to repeat them so many times." She started sullenly but readily.

(First Sample Made)

Low pitch and sullen voice. Often spits out words as though forced to do so. Calls out numbers in a very snippy tone, consistently raising her voice like a scolding mother that is insisting that the child obey. Lots of side glances at the writer; a cocked mouth of disgust. (Now on first mixed series. Now omitting and chewing fingers. Gives numbers in a very sarcastic tone. Pouts and looks at the writer in despair. Rubs face and hides it. Sighs heavily, pouts, and shows an expression of sheer tolerance despite self. Sighs then raises courage to call numbers in great disgust. "This is a lot longer than any of the others," she says in a voice laden with disgust, while shifting whole body.

2. C.R.: a boy, who stopped trying on the last day.

Fourth Day (other days skipped since they are very similar to first third of this day).

"This the last day?" he said when sought. "Yes." "Yippee, the last day; am I glad!" Came unwillingly but hurried when he found out that it was the last day. Started readily.

(First Sample Made)

Frowning and biting finger nails while rocking in chair. Quite composed and less active compared to other days. Corrected self and rationalized only once in three minutes. Confidence is quite high. Trying well. Voice full and confident. Noting the writer a lot. Still rationalizes once in a while with an "I mean," or "That is just what I meant," when an error is made. "How long did that take me?" "Today, you let me test you." (Now on juggled series.) Begins to call each number in a silly parrot-like voice—cheerful—silly—bass—soprano—loud—soft. "I don't get this!" Frown and silly face on a miss. Still silly and is becoming more so for last several minutes after a sober beginning. "You had a four there last time!" Sings numbers. Yelled "eight," laughs.

(Second Sample Made)

Quieter and softer. Lots of sighing and frowning and looking at box with belligerence. Drops voice to a whisper. "I don't want to do it any more!" "I don't want to do this!" "Can't I go now?" "There's the gang!"

(Third Sample Made)

Sitting very quiet. Yells, "I don't want to do it any more!" "Do I hafta do this?" "Wait, I'll do other ones; I don't want to do this one." "I don't want to do this one!" "I don't want to do this one!" Yells and grimances in an aggressive manner. Then sits still with hurt expression and calls same number over and over. When told that it was over, he asked, "Is this really the very last day?" and answered, "good," when assured. He left very pale. Left quickly even though he had mentioned a number of times that he was to test us on the last day. Later told a friend in his class that he had quit on us—"just would not do any more for them."

An Analysis of the Behavior During the Four Days

The purpose of the analysis of results in this section is to determine whether there is a more significant change in behavior on the fourth day than on the other three days.[3]

[3] The reliability of the categorizations made of the adjustment behavior was investigated by reclassifying the behavior of the entire group of subjects as described in the laboratory protocols under the following five headings: Aggression, Regression, Inattention, Anxiety, and Attention

The Fourth Day Behavior of the Group as a Whole Compared to its Behavior on the Other Three Days

The behavior of the group as a whole on the first three days may be compared to its behavior on the fourth day. The percentage of the group that showed each type of behavior on the four days is presented in Table 1.

TABLE 1

Per cent of total group showing each type of behavior over four days

Behavior	1st Day %	2nd Day %	3rd Day %	4th Day %	C.R. of diff. bet. days 3 & 4*
Defense	*17.9*	*20.6*	*27.2*	*24.9*	0.2
Aggression	20.0	21.2	25.5	25.9	0.0
Ag. Expt.	18.9	38.6	40.0	34.4	1.2
Ag. Exptr.	16.1	7.8	20.0	29.4	0.9
Against Self	30.6	25.3	16.5	2.8	2.2
Rationalization	18.9	13.6	27.2	27.2	0.0
Egocentrism	26.4	27.2	28.9	21.7	0.7
Withdrawing	*5.7*	*5.7*	*10.1*	*34.8*	2.6
Inattention	6.6	2.5	2.5	45.0	3.0*
Regression	2.5	5.0	10.0	29.5	2.0
Quieter (volume)	7.8	9.5	19.2	35.0	2.4
Non-Adjustive	*38.4*	*34.2*	*36.0*	*44.2*	0.6
Anxiety	58.9	55.0	47.8	64.7	1.5
Tension	17.8	13.3	18.6	18.6	0.0
Cooperation	*68.3*	*67.2*	*63.2*	*38.9*	2.6
Good natured	74.7	68.1	58.4	34.5	2.5
Att. High	83.9	89.7	90.3	48.9	3.0*
Poised	46.4	43.9	33.3	22.2	1.0

* Differences between days 3 and 4 are considered less revealing than differences between the *trend* of days 1, 2, and 3 and the socre of day 4.

In Table 1 the classes of behavior titled "Defense" and "Withdrawing" tend to show a rise in numbers of participants during the *first three days,* whereas Non-Adjustive Activity and Cooperation stay about the same. The following types of behavior tend to rise over the first three days: Aggression Against Experiment; Aggression Against Experimenter; Rationalization; Regression, and Quieter. The following types of behavior tend to fall during the first three days: Aggression Against Self; Inattention; Good Natured; and Poised. The following sub-head types of behavior tend to stay about the same over the first three days: Egocentrism; Anxiety; Tension; and Attention High. The changes over the first three days are not very large in most instances as will be found by comparing the figures in the first three columns of numbers in Table 1.

On the *fourth day,* some important differences from the trend in the first three days become apparent. Withdrawing and Non-Adjustive behavior rise, Cooperative behavior falls, while Defense stays about the same. (The per cent of fourth day Cooperative and Withdrawing behavior is different from the third day per cent

High. These reclassifications were made 14 months after the original ones. Agreement in recognizing a given type of behavior shows the following reliability:

First Day	85%	agreement ± 6.50%
Second Day	89%	agreement ± 5.70%
Third Day	87%	agreement ± 6.10%
Fourth Day	87%	agreement ± 6.10%
Mean	87%	agreement ± 6.10%

to an extent nearing statistical significance. C.R. equals 2.6). The following types of behavior rise in participation on the last day: Aggression Against Experimenter; Aggression Against Experiment; Inattention (C.R. of difference from third day is 3+); Regression; Quieter (C.R. of difference from third day is 2.4); and Anxiety. The following types of behavior fell on the last day: Aggression Against Self (C.R. of difference from third day is 2.2); Egocentrism; Good Natured. (C.R. = 3+); Attention (C.R. = 3+); and Poised. The following types of behavior stayed about the same on the last day. Rationalization; and Tension. *To summarize:* The situation on the fourth day produces a different pattern of behavior in the group as a whole from that of the other three days. The unsolvable problem of the fourth day produces an increase in per cent of participation in Withdrawing behavior and Non-Adjustive behavior, along with a decrease in Cooperation.

The Behavior of the Group as a Whole on the Last Half of the Fourth Day Compared to the Behavior on the First Half of the Fourth Day and the Halves of the Third

The most intense interference with the goal response occurs on the latter part of the fourth day as described in the procedure. The last half of the fourth day should, therefore, have produced different behavior from the first half of the fourth day and the last half of the third day. This assumption is investigated in Table 2. Analysis of the data will also provide answers to three questions:

1. Might not the change in behavior on the fourth day be due to the increase in difficulty of the series?
2. Might not the change in behavior on the fourth day be due to increasing fatigue at the end of the fifteen minute period?
3. Might not change in behavior on the fourth day be due to an accumulation of small frustrations?

TABLE 2

Participation in behavior on the halves of the third and fourth days for the entire group

Behavior	Third Day		Fourth Day	
	First Half Per cent	Second Half Per cent	First Half Per cent	Second Half Per cent
Defense	19.0	14.6	15.3	27.1
Withdrawing	5.7	7.2	3.8	35.0
Non-Adjustive	20.1	21.5	26.5	44.1
Cooperation	67.8	53.6	47.8	26.9

In Table 2 the sub-heads are omitted for the sake of brevity, since they tend to confirm the results contained in these broader headings.

It may be seen by inspection of Table 2 that slight trends are apparent, during the third day and first half of the fourth day. Defense, at the top of the table, tends to drop; Withdrawing tends to drop; Non-Adjustive Activity tends to rise, and Cooperation tends to drop. But all of these changes are very small. It is only in observing the *last half of the fourth day,* the last column in Table 2, that important changes are seen. It is apparent that Defense rises (it will be

recalled that Defense did not show a rise when comparing the entire fourth day with the entire third day); Withdrawing rises from four per cent to thirty-five per cent (C.R. of difference = 3+); Non-Adjustive Activity rises, and Cooperation drops.

The change in behavior on the last half of the fourth day is not due solely to an increase in the difficulty of the series. This is shown by the fact that the percentage of participation on the second half of the third day and the first half of the fourth day are smaller than the last half of the fourth day, even though the length and difficulty of the series is greater prior to the end of the fourth day.

The change in behavior on the last half of the fourth day is not due solely to fatigue since the last half of the third day is likely to have created as much fratigue as the last part of the fourth day and yet it has a lower per cent of participation in all behavior.

The change in behavior on the last half of the fourth day is not due solely to accumulation of small frustrations since the second half of the fourth day provided a sudden and complete shift from the behavior on the first half of the fourth day—too large a change for accumulation to account for. This conclusion is strengthened by noting the small change in behavior between the first and latter halves of the third day. If accumulation were a potent factor a larger change in behavior would be noted there.

It appears that the period during which the subjects are meeting the unsolvable problem creates the *greatest* change in behavior.

The Omissions and Gestures of the Subjects

A more objective type of behavior description than that presented thus far consists of the omissions that were made while the subjects attempted to learn the number series and the gestures noted by the observer during the three one-minute time samples in each laboratory visit. An omission is the failure of a subject to call a number before the three-second interval passed. Table 3 presents this data in terms of frequency per second.

TABLE 3

A comparison of the four days for the group in respect to means of the frequency per second of gestures and omissions

	First Day	Second Day	Third Day	Fourth Day	Fisher's "t" Comp. Days 3 & 4	% Level Sig.
Omissions						
Mean f. per sec.....	.022	.028	.029	.046	3.40	1%
Gestures						
Mean f. per sec.....	.176	.186	.187	.150	16.18	1%

It is apparent in Table 3 that the fourth day is quite different from the other three days, all of which are about the same. Note that the frequency of omissions significantly increases on the fourth day (1% level of significance), and the frequency of gestures shows a significant drop (1% level of significance) on the fourth day. The latter finding is interesting in the light of studies that point to the *increase* of gestures under

TABLE 4

A comparison of the four days for the group as a whole in respect to the number and per cent of neurotic mannerisms and the number of gestures

	First Day	Second Day	Third Day	Fourth Day
Total all Gestures	1034	1088	1070	847
Total Number Neurotic Mannerisms	422	444	456	385
Per Cent Neurotic Mannerisms are of all Gestures	40.8%	40.8%	42.6% ±9.03%	45.4% ±9.10%

emotional tension as described in McKinney (48) and Luria (39).

It is interesting to note that a child was usually much less physically active while omitting.

The Frequency of Neurotic Mannerisms Over the Four Days

The neurotic mannerisms contained in the time-sample list of gestures were removed and will here be considered separately. The definition of neurotic mannerisms and the classification scheme used is that developed by Olson (53) in the following manner:

> As a preliminary step in an attack on the problem to develop a method for the measurement of nervous habits in children, an inventory of tics based upon the literature was made. It was felt that this should furnish the objective symptomatology which would permit the development of a method of measurement. After some preliminary experimentation with the inventory it was evident that various groupings should be made for ease and objectivity of observation, and for applicability to the school situation. Groupings of habits were made as follows:
>
> 1. Oral (sucking thumb, sucking fingers, biting nails, protruding tongue).
> 2. Nasal (picking nose, scratching nose, wrinkling nose).
> 3. Hirsutal (pulling and twisting hair, scratching head).
> 4. Irritational (scratching body).
> 5. Manual (picking fingers, writhing hands, clenching fists).
> 6. Ocular (rubbing eyes, blinking eyelids).
> 7. Aural (pulling ear, picking ear).
> 8. Genital (manipulating genitals, thigh rubbing).
> 9. Facial (grimacing, twitching muscles).

The frequency of neurotic mannerisms for the entire group is shown in Table 4.

The results contained in Table 4 show that the total number of gestures made by all the subjects stays somewhat above 1,000 until the fourth day when the total drops to 847. The total number of neurotic mannerisms stays well above 400, with a steady rise for each of the three days, but on the fourth day the total drops to 385. Thus, although the total number of neurotic mannerisms drops, the proportion that they are of all gestures made by the subjects is about the same.

Comparing the number of neurotic mannerisms used by the whole group on the halves of the third and fourth days indicates a general agreement with the above trend.

Neither the fourth day, nor the last half of the fourth day, produced an important difference in the types of neurotic mannerisms used by the group as a whole at that time as compared to the types of mannerisms used on the other three days.

Summary of Behavior of Groups as a Whole

The data thus far serve as evidence for the proposition that there is a greater

change in behavior on the fourth (frustrating) day than on the other three days.

1. Behavior on the fourth day shows an increase in per cent of participation in Withdrawing and Non-Adjustive forms of behavior in comparison to the other three days. At the same time there is a decrease of Cooperation and no change in Defense. Half-day comparisons make these differences more vivid. Since the unsolvable problem occurs on the last half of the fourth day, it is apparent that the changes in behavior are produced by the frustrating situation.

2. The fourth day change in behavior is not alone due to fatigue, increasing difficulty, or accumulation of small frustrations.

3. There is a significant rise on the last day in the frequency of omissions per second.

4. There is a significant drop on the last day in the frequency of gestures per second.

5. The total number of neurotic mannerisms decreases on the last day, while remaining at about the same proportion of all the gestures on the other three days.

2. THE INDIVIDUAL DIFFERENCES IN BEHAVIOR ON THE FOURTH DAY AS COMPARED TO THE OTHER THREE DAYS

The purpose of this section is a gross study of children grouped according to their individual differences in behavior in the laboratory, and a further comparison of the behavior on the fourth day with the behavior on the other three days as found for these different groups.

The Division of the Subjects into Groups on the Basis of Reaction Types

The subjects were divided into groups on the basis of their fourth-day behavior in the laboratory. These groups were titled Stable, Upset, Apathetic, and Miscellaneous. The subject-membership and the definition of each category were determined by making a short summary of the behavior of each subject during the four days. Each summary was then placed on a separate card so that descriptions of similar fourth-day behavior could be brought together. Four groups of subjects broadly similar in behavior were apparent. There follows a summary statement of the type of behavior placed in each category. The reader will recognize these as common denominators in which there may be wide variations insofar as the presence of the behavior is concerned in any one individual.

Stable: Collected and calm behavior on the last day as well as on the other three days.

Upset: Tears, plus blushing and extreme emotional reactions on the fourth day.

Apathetic: Stopping, or nearly so, in attempts to solve the problem on the fourth day; no apparent emotions.

Miscellaneous: Those subjects not included in any of the above categories.

There were nine subjects in the Stable group, ten in the Upset, six in the Apathetic, and eight in the Miscellaneous group.

The Behavior of the Reaction Type Groups on the Fourth Day Compared to the Behavior of These Groups on the Other Three Days

A comparison of the behavior of the Stable, Upset, Apathetic, and Miscellaneous groups on each of the four days is described in Table 5. This analysis of the data depicts the differences in the group reactions.

To summarize Table 5: the behavior of each of the four groups during the first three days remains about the same, though rising or falling trends do appear. On the fourth day, however, there are many differences in the trend set up dur-

ing the first three days, especially in Withdrawing and Non-Adjustive types of behavior. The Upset and Apathetic groups show the most extreme changes on the fourth day in Withdrawing and Non-Adjustive Activity. However only the Upset group is significantly different, C.R. 3.0, on day 4 from day 3. The Stable group is least affected by the fourth day. The Miscellaneous group is unique only in the way that it rises in per cent of participation on the fourth day in Withdrawing behavior. The Apathetic group shows a significant drop in Cooperation on day 4.

each of the four days. If the change in behavior on the fourth day is a real one, the behavior classifications listed on the fourth day should differ from those listed for the other three days. The set of lists follows:

Stable Group—three forms of behavior with largest per cent of participation
First Day: Attention High, Poised, Good Natured
Second Day: Attention High, Good Natured, Poised
Third Day: Attention High, Good Natured, Poised
Fourth Day: *Attention High, Good Natured, Poised*

TABLE 5

Per cent of participation in the behavior described for the four groups over the four days

Behavior	Group	N = Number Cells*	Per Cent				C.R. of Difference between days 3 & 4†
			1st Day	2nd Day	3rd Day	4th Day	
Defense	Stable	30	13.3	20.0	15.5	17.7	0.0
	Upset	50	18.0	28.0	26.0	28.0	0.0
	Apathetic	30	30.0	28.6	46.6	26.6	1.7
	Misc.	40	17.7	15.5	17.7	17.7	0.0
Withdrawing	Stable	27	3.7	3.7	3.7	22.2	2.2
	Upset	30	13.3	13.3	20.0	53.3	3.0
	Apathetic	18	5.6	5.6	11.1	44.4	2.4
	Misc.	24	0.0	0.0	5.6	19.4	1.3
Non-Adjustive Activity	Stable	18	16.7	22.2	22.2	44.4	1.4
	Upset	20	45.0	45.0	55.0	60.0	0.0
	Apathetic	12	41.7	25.0	16.7	23.3	0.4
	Misc.	16	50.0	44.4	50.0	38.9	0.6
Cooperation	Stable	27	96.3	92.6	92.6	85.2	0.8
	Upset	30	56.7	46.7	40.0	16.7	2.0
	Apathetic	18	61.1	66.7	50.0	5.6	3.3
	Misc.	24	59.2	62.9	70.3	48.1	3.2

* Number of cells is the number of subjects in a group multiplied by the number of sub-types of behavior listed in Table 1.

† Differences between days 3 and 4 are considered less revealing than differences between the *trend* of days 1, 2, and 3 and the score of day 4.

The difference in the types of behavior displayed by the groups may be shown in another way. The highest three types of behavior, in terms of per cent of participation, will be listed for each group on

Upset Group—three forms of behavior with largest per cent of participation
First Day: Attention High, Anxiety, Good Natured
Second Day: Attention High, Anxiety, Good Natured

Third Day: Attention High, Anxiety, Regression
Fourth Day: *Regression, Anxiety, Quieter*

Apathetic Group—three forms of behavior with largest per cent of participation
First Day: Good Natured, Attention High, Anxiety
Second Day: Attention High, Good Natured, Anxiety
Third Day: Attention High, Good Natured, Rationalization
Fourth Day: *Inattention, Anxiety, Quieter*

Miscellaneous Group—three forms of behavior with largest per cent of participation
First Day: Attention High, Anxiety, Good Natured
Second Day: Attention High, Anxiety, Good Natured
Third Day: Attention High, Anxiety, Good Natured
Fourth Day: *Attention High, Anxiety, Good Natured*

It may be noted in the above lists that the Stable and the Miscellaneous groups have exactly the same form of behavior within their group on the fourth day as they do on every one of the other three days. In the Upset group, the first three days are dominated by Attentive behavior, whereas the fourth day develops the highest per cent of participation in Regression. The Apathetic group shows Attentive and Good Natured behavior most frequently on the first three days, while on the fourth day they become Inattentive, Anxious, and Quieter, a different picture from the first three days.

It may be concluded that the fourth day is unusual in the type of behavior that is shown, and moreover, some groups of subjects find the fourth day a situation that creates more extreme changes in their behavior than do other groups of subjects. Those subjects who change the most on the fourth day (Upset and Apathetic groups) display more Withdrawing and Non-Adjustive behavior than do the groups of subjects who change least on the fourth day.

When the halves of the third and fourth days are compared for the four reaction type groups in respect to per cent of participation in the various types of behavior, the results strongly support those already given.

The Frequency of Omissions for the Four Groups

The frequency of omissions-per-second for each of the reaction-type groups of subjects over the four days is of interest. An omission is the failure of the subject to call a number before the three-second period allotted for each number is passed. It may, therefore, be a technique for Withdrawing. The relation of its use to various subject groups thus becomes important. These data are presented in Table 6.

Table 6 reveals that the first three days are about the same in frequency of omissions per second for the Stable, Upset, Apathetic, and Miscellaneous groups. In other words, all groups show little variation over the first three days. On the fourth day the Stable group of subjects rises little in frequency of omissions per second. The Upset and Apathetic groups show a significant rise in frequency of omission per second on the fourth day. The Apathetic group more than doubles its frequency of omissions while the Upset group does likewise.

If the omission may be considered a method of adjustment, it is apparent that the fourth day brings about a much greater usage of his adjustive device by the Upset and Apathetic groups.

The Relation of Kinds of Neurotic Mannerisms to the Four Groups of Subjects

The fourth day fails to differentiate between groups insofar as the frequency

of neurotic mannerisms is concerned, each group being approximately equal in frequency.

As for types of neurotic mannerisms, all four groups preferred the same mannerisms on the first three days: these are oral, facial, and manual, in that order. On the fourth day, however, the Apathetic group displayed slightly more irritational neurotic mannerisms than they did any other, and the Miscellaneous group used manual neurotic signs more than they showed any others.

If interference affects the kind of neurotic mannerisms shown by an individual, the last half of the fourth day should produce gestures different from the first half of the fourth day and the last half of the third day. An investigation of this assumption revealed that the Upset and Apathetic groups used irritational neurotic mannerisms more than any other kind, whereas the Stable and Miscellaneous groups preferred oral mannerisms more than any other kind. The fact that the Upset and Apathetic groups stroke, pat, and rub themselves most often while showing Withdrawing behavior may be an indication of the self-protective withdrawal that these subjects indulge in when frustrated.

On the whole, however, these mannerisms do not occur with sufficient regularity during frustration to serve as an indicator or symptom of the presence of frustration.

Summary of Discussion of Individual Differences

1. The behavior of the Upset, Stable, Apathetic, and Miscellaneous groups remains about the same *during the first three days* although rising and falling trends do appear.

2. *On the fourth day* there are many differences from the trend established on the first three days. The Stable and Miscellaneous groups have their highest participation in High Attention; the Upset group in Regression, and the Apathetic group in Inattention.

3. On the fourth day of the Upset and Apathetic groups use the omission twice as frequently as on the other three days. For these two groups day 4 is significantly different on the 1 per cent level from day 3. The Stable and Miscellaneous groups increase little in omissions.

4. The groups cannot be differentiated on the basis of frequency of neurotic mannerisms.

5. The Upset and Apathetic groups use irritational neurotic mannerisms more than any other kind. Except for these slight differences, the groups are the same.

TABLE 6

Frequency of omissions per second for the four subject groups for the four days

Group	Frequency per Second				"t" of Difference between days 3 & 4	% Level of Sig.
	1st Day	2nd Day	3rd Day	4th Day		
Stable	.017	.018	.016	.019	1.8	12%
Upset	.031	.044	.036	.067	6.5	1%
Apathetic	.019	.030	.036	.078	8.4	1%
Miscellaneous	.019	.025	.026	.040	2.0	8%
Total Group Mean	.022	.028	.029	.046	3.40	1%

An Interpretation of the Results Thus Far

The behavior of the subjects on the fourth day of this experiment is different in kind and quantity from their behavior on the other three days of this study.

The only change in the operation of this experiment on the fourth day as compared to the other three days is in the insolubility of a problem which was within the subject's level of aspiration. Therefore, the change in behavior on the fourth day is due to the failure of the subject in solving the number series.

The unsolvable problem fulfills the definition of a frustrating situation. The change in behavior, therefore, is due to a frustrating situation. This conclusion agrees with a common finding in all studies of frustration, namely, that frustration produces a change in behavior.

3. THE BEHAVIOR OF SUBJECTS WHO HAVE AN INCREASE IN NEUROTIC MANNERISMS DURING THE FRUSTRATING SITUATION COMPARED WITH SUBJECTS WHO HAVE A DECREASE IN NEUROTIC MANNERISMS

The separation of groups on the basis of a decrease or increase in neurotic mannerisms during the fourth day was made in the following manner. A mean of the neurotic mannerisms shown by the subjects for all the first three days was obtained for each subject. Those subjects who had a fourth day total of neurotic mannerisms in excess of this mean were considered the group "with an increase in neurotic mannerisms." Those subjects who had a total number of mannerisms on the fourth day smaller than the mean were called the group "with a decrease in neurotic mannerisms." The extreme eight subjects in each of these groups were identified and their behavior ratings taken from the master rating sheet in order to prepare Table 7.

TABLE 7

Per cent of fourth-day participation in behavior titled for group with increase in neurotic mannerisms and group with decrease in neurotic mannerisms during frustration

Behavior	N = Number of Cells*	Per Cent		C.R. of Difference between Two Groups
		Group with Increase in N. M.	Group with Decrease in N. M.	
Defense	40	35	25	1.0
Withdrawing	24	24	33	—
Non-Adjustive	16	44	31	—
Cooperation	24	29	58	2.1

* Number of cells is the number of subjects (8) in the group multiplied by the number of subtypes of behavior listed in Table 1.

Table 7 reveals that the group of eight subjects with an increase of neurotic mannerisms on the fourth day has a greater per cent of participation in Defensive, Withdrawing, and Non-Adjustive behavior than does the group of eight subjects with a decrease of neurotic mannerisms on the fourth day; these differences, however, are not large. The group of subjects with a decrease in neurotic mannerisms is more cooperative than the group with an increase in neurotic mannerisms.

The group with an increase in neurotic mannerisms is highest in Non-Adjustive and lowest in Cooperative behavior. The group with a decrease in neurotic man-

nerisms is highest in Cooperitive and lowest in Defense behavior participation.

4. THE BEHAVIOR OF THE MOST INTELLIGENT SUBJECTS COMPARED WITH THE BEHAVIOR OF THE LEAST INTELLIGENT SUBJECTS DURING FRUSTRATION

The subjects were separated into two extreme groups of eight each on the basis of intelligence.[4] What differences in reaction to this frustrating situation were there between groups of high (Group Mean I.Q. 137.1) and low (Group Mean I.Q. 100.5) intelligence?

The group with the highest intelligence has a significantly greater degree of participation in Cooperation than the less intelligent group as may be seen in Table 8. The least intelligent group has a higher per cent of participation in Defensive, Withdrawing, and Non-Adjustive behavior than does the group with higher intelligence, though none of these differences are significant. It is apparent that cooperative behavior is the most differentiating factor between the two groups. The more intelligent have the greater per cent of participation in Cooperation while the least intelligent have the lowest per cent of participation in Cooperative behavior.

5. A COMPARISON OF THE BAHAVIOR OF THE BOYS AND THE GIRLS DURING THE FRUSTRATING SITUATION

The subjects were divided according to sex and their per cent of participation in the main behavior forms set forth in Table 9. There are seventeen children of each sex.

TABLE 8

Participation in the behavior titled for most intelligent and least intelligent during frustration

Behavior	N = Number of Cells*	Per Cent		C.R. of Difference between Two Groups
		Most Intelligent (Mn. I.Q. 137.1)	Least Intelligent (Mn. I.Q. 100.5)	
Defense	40	17	28	—
Withdrawing	24	25	46	1.5
Non-Adjustive	16	44	51	—
Cooperation	24	67	17	4.0

* Number of cells is the number of subjects (8) in the group multiplied by the number of subtypes of behavior listed in Table 1.

This table reveals that the boys participated in more Withdrawing and Non-Adjustive behavior during the fourth day than did the girls, whereas the girls participated in more Cooperative and slightly more Defense behavior than did the boys. Note that the boys were highest in Non-Adjustive behavior and lowest in Defense whereas the girls were highest in Cooperation and lowest in Withdrawing.

TABLE 9

Participation in the behavior titled for seventeen boys and seventeen girls during frustration

Behavior	Per Cent		C.R. of Difference between Boys and Girls
	Boys N = 17	Girls N = 17	
Defense	18	30	2.2
Withdrawing	43	27	—
Non-Adjustive	53	38	—
Cooperation	25	51	2.74

[4] Intelligence scores from record folders of subjects on basis of Kuhlman-Binet individual tests given within ten months of this experiment.

The proportion that neurotic mannerisms are of the total number of fourth-day gestures is very little different for the two sexes. For the boys it is 46.9 per cent and for the girls 44 per cent. The boys had a slightly higher mean number of neurotic mannerisms during the frustration amounting to 14, whereas the girls had a mean of 11. These figures are of interest in light of the fact that Olson (53) found the opposite. The girls he observed had a significantly higher mean number of neurotic mannerisms than did the boys.

To summarize the difference between the sexes, it is apparent that the boys are typified by Non-Adjustive behavior, whereas the girls are exemplified by Co-operation.

6. THE REACTION TO FRUSTRATION REVEALED BY SUBJECTS HIGH IN CERTAIN MEASURES, WITH SUBJECTS LOW IN THE SAME MEASURES

Results of the following measurements were available among the records of the children in this school: Furfey-Sullivan Maturity-Immaturity Scale; Haggerty, Olson, Wickman Behavior Rating Scale; Relation of Personality Development to Physical Growth, estimated by Byron O. Hughes;[5] Reweighting of Haggerty, Olson, Wickman Behavior Rating Scale to form Measure of Extroversion and Introversion; Mechem's Affectivity Score;[6] Subject's Total Amount of Neurotic Mannerisms on Fourth Day as recorded in this investigation; Intelligence.

After the scores on each of the above mentioned measures had been determined for each subject, they were separated into two extreme groups for each test; one group made of subjects with the superior scores on the given test, the other group with the most inferior test scores. The most typical behavior during the fourth day frustration was then determined for each extreme group by studying the behavior ratings of each subject.

The immature group, as measured by the Furfey-Sullivan Maturity-Immaturity Scale, used Regression, Anxiety, and Quieter behavior in meeting the frustrating situation on the fourth day. The mature subjects, on the other hand, were typified by Attention, Good Nature, and Anxiety.

Similar general behavior patterns are to be found in the superior and inferior groups on the Haggerty, Olson, Wickman Behavior Rating Scale, the emotional stability estimates by Hughes, the present-study count of neurotic mannerisms (for comparison) and Intelligence. It appears that this kind of a general *summary statement* of the trend can be made: The inferior group in these evaluations is typified by either Regressive or Inattentive behavior, or both. The superior group is typified by either Aggressive or Attentive behavior or both.

This summary statement holds true in every instance except in the case of introversion and extroversion. In that case the introverted subjects, a commonly conceived inferior personality type, show High Attention instead of Inattention which the above summary statement would lead one to expect. The extroverted, superior subjects show Anxiety, Rationalization, and Aggression against the Experimenter. These results support the findings of Marston (47).

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[5] Research Associate in Child Development, University of Michigan, pioneer with Willard C. Olson, Professor of Education, University of Michigan, in studies relating personality development to growth.

[6] Test devised by Elizabeth Mechem, Psychometrician, University of Michigan Elementary School, as a measure of subject's feeling tone toward certain experiences. In press as her doctoral dissertation.

A study of the average number of neurotic mannerisms for each of the subject groups reveals that the Immature subjects on the Furfey-Sullivan Maturity-Immaturity Scale had a mean of 13.1 neurotic mannerisms on the frustrating day. The Mature subjects, however, had a mean of 8.6 neurotic mannerisms during the frustrating situation. This means that the superior group (Mature) had fewer neurotic mannerisms than the inferior group (Immature). Each of the superior and inferior groups shows a comparable picture when the mean number of neurotic mannerisms of each of these pairs of groups is compared. The following *summary statement* can be made (although no statistically significant differences occur the trend is consistent): The group that is inferior in the personality measured used consistently showed a higher mean number of neurotic mannerisms than the group that is superior in the given measurement used.

7. ANECDOTAL INDICATIONS THAT THIS EXPERIMENT WAS AN UNPLEASANT ONE FOR THE SUBJECTS

Random observations of the children's behavior outside the laboratory were made by the experimenter and others during and for a year following this study. Among these were many indications that the children disliked the experiment, and often disliked the experimenters although the behavior of the subjects toward them had always been most friendly before the study began. These anecdotal notes are not restricted to group and individual behavior shown after the fourth day, since, as previously noted in the classification of laboratory behavior and explained in the procedure, some of the subjects began to show signs of dislike for this experiment on earlier days. Nor do the anecdotes purport to show a significant change in fourth-day behavior as compared to behavior on the other three days. Their random nature prevents that. Their purpose is to demonontrate the effect of this study on the behavior of the individual and his group as shown outside the laboratory. A number of these notations follow:

One teacher asked how much longer we would be working with her children, since "the study has disrupted the whole group." "I do wish that it were possible for you to work with some other group," she added. (The experimenters had been working with her group for two weeks.) In a staff meeting some months later, this teacher earnestly hoped aloud that the writer would not again be working with her children.

One member of the University staff come to inquire about the study since her child complained at home that she did not wish to go to school if she had to return to the laboratory. The parent, a psychologist, had great difficulty in persuading the child to return to the laboratory.

Remarks made to their teachers by the subjects demonstrates the bad reputation that this experiment had with them. Typical of their remarks are: "What they do down there makes me so mad!" "I liked it at first. At the end I hated it!" "Those guys think they are so smart!" "I don't see what it teaches you!" "I quit on them." "Don't go with him, E; it's a silly waste of time!" "There he (experimenter) is again; he has ruined my day!" "I don't want to go!"

Individual cases of hitting the writer, making faces at him, calling names, aggressive remarks, and even kicking him were frequent during the weeks of the study, happening at least once a day as he passed through the class room or the hall.

After a fourth-day session, one boy (D.L.) who had ceased trying in the laboratory, but had shown no signs of aggression, returned to the class room and immediately started a fight, a tendency that was quite foreign to his personality. The teacher described the incident:

> D. resisted all children and both teachers, cried, screamed, beat the floor. This because Bob had said, "Hey, you! Come out of there and shut up!" D. hit Bob a hard wallop on the jaw, nearly knocked him down. Later, he told me he was just straightening the rugs and not the one making the noise and that he resented the accusation.

A sixth grade "clique" who had been through the experiment goaded various class-members into resisting the experimenters. The complexion of that relationship definitely changed for the better as the weeks went by (see reason below). In the fifth grade a normal reaction was that a subject, returned from the laboratory on the last day, would help the writer and the teacher, invite the next subject to come to the laboratory. Sometimes this was a savage command: "Come on, B., you gotta go!"

Two-thirds of these subjects had attended the University of Michigan Elementary School for a number of years so that they were used to being tested and being used in experimental situations. When the subjects learned that the experimenter was taking children from their groups they cried, "Take me," whenever he appeared in the room. After the first set of four subjects were finished and had circulated in the group, difficulties began to arise. An assistant teacher reported hearing a group plan to stay away from the laboratory, when sent for, until the writer appeared to escort them. Later the teacher of the sixth grade reported that the group was definitely planning to "gang-up" on the "test." The clique agreed among themselves that they would not call any numbers in the laboratory.

Conferences by the writer with the school psychologist and other workers in the building made it apparent that this is not a typical reaction to studies in which they are asked to participate. Study of the individual intelligence protocols showed that it was a very rare instance when the subjects objected to being tested.

The writer has had years of experience in informal relations in camps and on playgrounds with this age group and has no reason to believe that he personally antagonizes children; in fact, it has always been quite easy for him to be close friends with them.

A deliberate attempt was made to cultivate a strong rapport before each experimental session with each subject. It was assumed that rapport had been established when the subject had had one strong laugh.

This was not enough. Disrupting unfriendliness continued, so the sixth grade was temporarily abandoned in favor of the fifth grade.

In the new room the writer profited by the experience in the previous classroom. Here, an inside worker was created for the group. This person was the most popular child in class, selected with the help of the teacher. He was taken to the laboratory for the four consecutive days, given easy number series, a pleasant time, and was made to believe that his experience was typical for all the other subjects. Other subjects preceded and followed this boy, and fortunately, they compared experiences. Peter, the popular one, explained in detail (so said one of the subjects) how easy the task is and what fine fellows the experimenters are. The fifth grade did not "gang up" on the experiment.

Upon returning to the sixth grade group, the same technique was used with another popular student. Peter was now in this room so that he could greet the writer cheerily as would the teacher and the new pupil friend. Now the sixth grade did not "gang up" on the experiment.

A number of children hid upon being sought. One girl would hurry into the girls' lavatory and would remain there as long as the experimenters waited. Some hid under tables, or in a distant part of the building. Hiding of this kind occurred several times when the child was being sought for the fourth day, but it appeared more often when the experimenter would pretend to seek a subject for a fifth, sixth, or seventh day in succession hoping to discover how long the fourth day antagonism would remain. Hiding became less fashionable after the friendly interpreters (described above) were planted in the room. During the last four weeks of the eight-week experimental period it completely disappeared.

In the fall, after the summer during which most of the data were gathered, the writer stepped into one of the class rooms. Immediately a groan arose; heads were hidden. Exclamations of "Oh, oh, look out!" or "Don't take me!" rang out. The teacher whose back was turned to the door, was able to guess the visitor's identity without turning around.

Most of the girls and a few of the boys still (one year later) consider the writer to be their enemy. When they are in a group, some will greet the writer and some will not. Most of the boys are quite friendly; none are overtly unfriendly. About two-thirds of the 17 girls are overt enemies. They stick out their tongues, toss their heads, run away, or turn their backs.

To summarize: This "test-sophisticated" groups of subjects showed dissatisfaction toward the study in many ways outside the laboratory, both toward the experimenters and members of the subject's school group.

By raising our prestige with the group through the medium of friendly interpreters, the aggression against the experimenters became less violent and frequent, often being directed at class-mates and teacher instead.

It should be noted here that many of the subjects who showed no aggression in the laboratory setting were aggressive in their later contacts with the experimenters outside the laboratory.

IV. Discussion of Results

The Consequences of Frustration

The frustrating situation in this study led to a change in the behavior of each subject, but no one form of behavior was a typical occurrence. This finding is important in the light of recent studies, many of which support the hypothesis that one form of reaction is more important than others as a consequence of frustration. But frustration is a more complex situation than these studies would imply. The Yale group, for instance, hypothesize that frustration always leads to Aggression; and diversity in reaction to frustration they call *substitute responses* which relieve tension that would otherwise persist until the organism becomes aggressive. The present study shows that what they call "substitute" responses are much more frequent, and at least as intense, as aggressive reactions to frustration. Are not, therefore, "substitute" responses and their interrelations likely to be a more productive area of research in human behavior on their own account than is the frustration-aggression hypothesis?

There were individual differences in reaction to this situation, expressed in behavior changes of a qualitative or quantitative nature or both. These differences appear to be the result of (1) individualized habits of meeting frustration, and (2) varied potency of this situation in threatening the personality of difference subjects. To some subjects failure on the last day and even small errors on other days was an emotional experience as demonstrated by their reactions. Others were very little perturbed as a result of such misfortunes. Furthermore, each individual between these two extremes showed a set of behavior patterns typical unto himself. Some subjects, for example, maintained an unruffled calm during the frustration of the last day, except toward the end when traces of Aggression began to appear. Other subjects, however, began to show signs of Aggression at the very beginning of the last day and even on the second and third day. That individual differences appear as a result of frustration is a common finding in other research.

The type of reaction to frustration is partly controlled by the type of frustration. It was apparent, for example, during the development of the method used in the present study that the reactions of the subjects when failing on a nailed-shut Freeman puzzle box were quite different from those shown when the same subjects were not succeeding on a cardboard T-puzzle, while reaction to frustration on the flash-box was again different. Maier (45) says in point: ". . . it is possible that different kinds of frustration produce characteristic alterations of behavior in rats. Position habits and abortive jumping developed by the no-solution method are undoubtedly products of one kind of frustration, whereas the experimental neurosis seems to rise from a different kind of frustration." Haslerud (26) had the same general finding in his work with apes on different kinds of frustrating situations. He concludes, in part: "Behavior because of frustration is much more a function of how a reward expectancy is thwarted than a simple loss of reward."

The general personality adjustment of these subjects had a parallel relation to the type of behavior shown during the frustration. Persons who had inferior personality development, as measured by various personality techniques, tended to use either Regression or Inattention in

reacting to frustration, or both. Persons who were superior in personality development tended to use either Aggression or Attention, or both, in meeting frustration.

The significant drop in gestures on the fourth day for the group as a whole was unexpected in the light of previous studies. However, there was too much irregularity between individuals in the group to characterize this decrease as a symptom of frustration. Some subjects actually increased in total gestures during frustration while others decreased.

Considering only those gestures which were classed as neurotic mannerisms, other findings deserve comment. When the subjects were grouped under the titles Stable, Upset, Apathetic, and Miscellaneous, on the basis of this fourth-day reaction, there was little difference in the mean number of neurotic mannerisms for each group on the fourth day. And yet, it was obvious, in a different grouping of the subjects, that those with inferior personality development (as indicated by various measures) tended to show more neurotic mannerisms than the subjects with superior personality development. Adams (1) had a finding comparable to this when he studied the frustrated-agitated behavior of groups, separated on the basis of susceptibility to frustration, and found little difference in gestural behavior. But, agitated behavior did differentiate his high and low groups of subjects on the Neurotic Tendency Scale of the Bernreuter Personality Inventory.

When the neurotic-mannerisms frequencies were brought into comparison with the kind of adjustment mechanism used by the subject during frustration, it became apparent that the group of subjects preferring either Regressive or Inattentive behavior or both in adapting to the failure of the fourth day had a mean number of neurotic mannerisms higher than the group of subjects prefering either Aggressiveness or Attention or both to the task.

It may be that the common denominator here is the direction of energy placement. Regressive and Inattentive behavior, for example, are forms of random, retracting, inwardly-directed protective energy usage. Both types of behavior are escapes from the problem and are self-bolstering in essence. (The omission is a technique for withdrawing in this study. Note that the Upset and Apathetic groups used significantly more omissions on day 4 as compared to day 3.) Attentive and Aggressive behavior are forms of outwardly-directed eager striving. In both of these types of behavior the organisms are alertly working toward an apparent goal; attention is directed to solution of the problem, while Aggression is directed to removal of the source of unpleasantness which is the flash-box or experimenter. This interpretation would imply, therefore, that inward or non-goal directed behavior leads to no reduction of neurotic mannerisms whereas outward, goal-directed behavior results in a diminution of neurotic mannerisms.

Another way of interpreting this difference is that the lack of vigor characteristic of Regressive or Inattentive behavior does not reduce tension, and therefore frequent usage of neurotic mannerisms serves as the necessary energy release. On the other hand, the alert actions of Aggressive or Attentive behavior may reduce tension, and therefore usage of neurotic mannerisms is not necessary in order to lower tension. In any event, it appears that Regression is a less efficient

form of adjustment than is Aggression.[7]

Indeed, there is some evidence to indicate that Aggression is a normal, healthy form of adjustment rather than a manifestation of maladjustment, or a form of abnormal behavior. Evidence to support this finding may be listed:

1. Aggression in this study accompanied fewer neurotic mannerisms than did other forms of behavior and thus, it is assumed, accompanied lowered bodily tension—a more healthy state than high tension.

2. The subjects who are superior (i.e. better adjusted) on various personality tests used Aggression more frequently than did the inferior subjects.

3. Aggression was more closely related to Attention in the patterns of behavior shown on the fourth day than any other type of behavior. It may be assumed that Attention to the task is a healthy form of adjustment.

4. The friendliest subjects were the most Aggressive.

5. Aggression occurred more than any other type of reaction during the informal casual contacts outside the laboratory between the experimenters and the subjects.

The Gestalt of the situation *may* also be an important factor in determining the normality or abnormality of Aggression. Aggression may be considered normal in the present instance because it is justified by the frustration that the subjects have been forced to experience. Obviously, Aggression would not have been a normal response if the only contact that occurred between the writer and subject had been a brief smile. Aggression, then, is a normal form of response when the situation justifies it, and abnormal when the situation does not justify it.

It is interesting to note the instigation to Aggression among the subjects who preferred Attentive behavior. If Attention to the task may be used as an indication of the strength of the goal response, it becomes apparent that the subjects with the stronger drive used Aggression, which is tentative support for the Yale group (13) hypothesis that "the strength of instigation to aggression varies directly with the strength of instigation to the frustrated response."

The Yale group also makes the hypothesis that Aggression increases with an increase in strength of interference with the goal response. The present investigation supports that finding and offers a modification. The modification is that subjects who tend to become emotionally unstable under frustration (i.e. Upset group) react aggressively to a much smaller degree of interference, that is, their threshold of frustration is lower. Subjects who tend to remain Stable in the face of frustration tolerate a much higher degree of interference with a goal response before becoming Aggressive.

AN EXPANDED DEFINITION OF FRUSTRATION

In the light of the findings of this study, the definition of frustration as offered by the Yale group (13) may well be extended and modified. The Yale definition is: "Frustration is that condition which exists when a goal response suffers interference."

The enlarged definition suggested here is: *Frustration is that condition which*

[7] Pavlov (55) and Krasnogorski (34) claim that neurotic behavior results from an imbalance between "excitation" and "inhibition" in a *conflict* situation. In the present study Aggressive or Attentive behavior may be the same as their "excitation," whereas Regressive or Inattentive behavior may be the same as their "inhibition."

exists when a response toward a goal believed important and attainable by a given person suffers interference, resulting in a change in behavior characteristic for that person and situation.

The definition takes into consideration the following factors:

1. That some change in behavior always occurs as a result of frustration. This change may be adaptive or non-adaptive.

2. That a situation cannot be frustrating unless it is within the field of aspiration of the individual.

3. That there are characteristic individual differences in reaction to this situation.

4. That the type of reaction to frustration is partly controlled by the type of frustration thus producing characteristic alteration in behavior.

5. That behavior is goal directed.

6. That the psychological principles postulated by the Yale group will be met by the dynamics of behavior described in this definition.

V. Summary

The objectives of this study

This study is an objective investigation of the reaction of human beings to a frustrating situation. The objectives are specifically stated thus:

1. To develop a frustrating situation similar in all other respects to a previous control situation.

2. To study the change in behavior of children that is caused by this shift from the control to the frustrating situation and which supports the notion that this is a frustrating situation.

3. To determine if there are characteristic behavior patterns displayed during the frustrating situation.

Summary of procedure

The method used is described on pages 7-10.

The behavior of the subjects was categorized as a result of studying the laboratory protocols of this group. The four main headings of this classification scheme are: Defense, Withdrawing, Non-Adjustive Activity, and Cooperation. A number of sub-heads are listed under each of these headings with a three-level intensity rating scale for each sub-head. The neurotic mannerisms, included among the gestures noted, were removed and tallied according to Olson's grouping of neurotic habits (53).

Summary of results

Many types of data showed that the fourth day behavior for this group as a whole was quite different in quality and quantity from the behavior of the subjects on the other three days. The following were the most important changes noted in reaction to the frustrating situation of the fourth day: (1) The per cent of participation in Withdrawing and Non-Adjustive forms of behavior increased on the last day while Cooperation decreased and Defense behavior showed little change in the numbers using it; (2) there was a significant (sig. at 1 per cent level) drop on the last day in the frequency of gestures per second; (3) there was a significant (sig. at 1 per cent level) rise in the frequency of omissions; and finally (4) the total number of neurotic mannerisms decreased while remaining at about the same proportion of all the gestures on the other three days.

Individual differences were found in the behavior of subjects who were divided into Upset, Stable, Apathetic, and Miscellaneous groups on the basis of their fourth-day behavior in the laboratory. The behavior of each of these four groups during the first three days remained about the same, though rising and falling trends appeared. However, during the frustrating experience of the fourth day there were many differences from the earlier patterns: the Stable and Miscellaneous groups had their highest participation in High Attention; the Upset group in Regression, and the Apathetic group in Inattention; the Upset and Apathetic groups used the omission twice as frequently (difference significant at the 1 per cent level) as on the other three days while the Stable and Miscellaneous groups increased only slightly in omissions; the Upset and Apathetic groups showed Irritational and neurotic mannerisms more than they displayed any other form whereas the Stable and Miscellaneous groups preferred oral mannerisms to any other kind. However, the groups could not be differentiated on the basis of frequency of gestures and neurotic mannerisms.

The reaction to frustration by groups

of subjects separated on the basis of frequency of neurotic mannerisms, intelligence, and sex was investigated. The results reported are concerned with behavior on the fourth day only and show that each of the groups was distinctly different in the type of reaction shown to frustration. The group with an increase in neurotic mannerisms participated mainly in Non-Adjustive activity while the group with a decrease in neurotic mannerisms had its greatest participation in Cooperative behavior. Cooperative behavior was the most differentiating factor between the groups with the highest and lowest intelligence ratings, those of the higher intelligence having the greatest per cent of participation in Cooperation in contrast to those with the lowest intelligence who had the lowest per cent of participation in Cooperative behavior. When the subjects were separated according to sex, it was clear that boys are typified by Non-Adjustive behavior and girls are exemplified by Cooperative behavior. Curiously enough, the boys had a slightly higher mean number of neurotic mannerisms during the frustration than the girls, a finding which is directly the opposite of that of Olson (53) when he studied schoolroom behavior.

The scores were found for each subject on seven different types of measurements related to the personality (Furfey-Sullivan Maturity-Immaturity Scale; Haggerty, Olson, Wickman Behavior Rating Scale; Relation of Personality Development to Physical Growth; Reweighting of Haggerty, Olson, Wickman Behavior Rating Scale to form Measure of Extroversion and Introversion; Mechem's Affectivity Score; Subject's Total Amount of Neurotic Mannerism on Fourth Day as Recorded in This Investigation; Intelligence) and two extreme groups were determined for each of these measures; one group made up of subjects with the most superior scores, the other group with the most inferior scores. Most-often-displayed behavior was determined for each of these groups:

1. The group that was inferior in the test used was typified by Regressive or Inattentive behavior or both, whereas the group that was superior in the measure used was typified by either Aggressive or Attentive behavior or both.
2. The group that was inferior in the measurement used had a higher mean number of neurotic mannerisms than the group that was superior in the given measurement.
3. Therefore, these results show that the Regressive, Inattentive subjects used a higher mean number of neurotic mannerisms than the Aggressive, Attentive subjects.

This "test-sophisticated" group of subjects showed dissatisfaction toward this study in many ways outside the laboratory, both in relations with the experimenters and the subject's school group. Serious Aggression against the experimenter was deflected into the group by the use of popular students who were taken to the laboratory but not frustrated, and who later professed a liking for the experiment and the experimenters in their classroom.

DISCUSSION OF THE RESULTS

A discussion of the results indicated the importance of the following findings:

1. The frustrating situation in this study led to a change in the behavior of each subject, but no one form of behavior was a typical occurrence.
2. There were individual differences in reaction to this situation, expressed in behavior changes of a qualitative or quantitative nature, or both.

3. The general personality adjustment of these subjects had a positive relation to the type of behavior shown during frustration.
4. The frequency of neurotic mannerisms appears to have a relation to the type of behavior shown during frustration.
5. Aggression seems to be a normal, healthy form of adjustment rather than a manifestation of maladjustment, or a form of abnormal behavior.
6. Frustration may be defined in the light of this study as that condition which exists when a response toward a goal believed important and attainable by a given person suffers interference, resulting in a change in behavior characteristic for that person and situation.

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